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About InterRegioNovation

InterRegioNovation is the International Association devoted to the transfer and exchange of knowledge and innovations at all regional levels (country, region, city, community etc.) between knowledge transfer professionals (business, research institutions, policy makers, government agencies, individuals, others) in all countries of the enlarged Europe, CIS countries and from other continents for stimulating and enhancing economic and social growth in the regions.

This is a policy and research association that brings together all knowledge transfer professionals who are interested in delivering efficient, flexible, innovative and cost-effective services across the private and public sectors. We work closely with business, research and educational institutions, government agencies, policy makers, NGOs, media, individuals and other stakeholders to promote the interests of their industries.

Our members understand the changing needs of the transfer and exchange of knowledge and innovations and through continuous professional development, marketing and networking opportunities offered in this association, we keep current with the latest knowledge trends and issues that challenge people in their work and life journey. We also offer expansive opportunities for partner connection through our networks.

Journal "Regional Innovations" is one of the Association's tools for innovators and everybody who is interested in any aspects of innovation development.

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About journal

On behalf of the Editorial Board, it gives us a great pleasure to welcome you to the third issue of 2018 of the Regional Innovations Journal. This is a thematic special issue dedicated to broad aspects of **Medical Science and other innovative research areas** from basic research to clinical and experimental work.

This particular volume provides a platform for advances in basic, translational and clinical research and includes original papers on medical and clinical research, health care innovations, reviews, medical teaching, medical law, medical ethics, spirituality and medicine, policy environmental medicine and integrative general practice. Researchers in academic and clinical settings as well as health professionals are encouraged to publish their theoretical and experimental results in this journal, which aims to integrate expertise in different medical specialties.

This is an independent, peer-reviewed, Internet-based international journal devoted to publishing original research papers of highest quality, sharing ideas and discussing innovation sector within regional dimensions. The journal welcomes to submit research papers by exceptional innovators, leading universities, globally recognized business, government agencies, policy makers and political leaders.

We intend that our readers will be exposed to the most central and significant issues in innovations development. We wish to publish papers that exemplify the highest standards of clarity, and that promise to have significant impact on existing front-line debates or to lead to new ones. The journal explores key priorities of the knowledge and innovations transfer and exchange in terms of critical aspects of human life (economy, law, science, business, health, education, culture etc.). We therefore welcome submissions not only from established areas of research, but also from new and emerging fields and those which are less well represented in existing publications, e.g. engineering studies, biomedical research etc.

We also strive to ensure that being under expert evaluation, each submission will receive developmental and supportive comments to enhance the article. Our refereeing process will involve that each submission will be reviewed by one or more specialists in the relevant field. Articles will be added to the volumes and the journal audience will receive e-mails updates to encourage them to the new articles.

We are delighted with, and immensely grateful to the large numbers of colleagues, both members of the Associations InterRegioNovation and FranceXP (France), representatives from many universities in France, Latvia, UK, Azerbaijan, China, Nigeria, Belarus, Ukraine and other institutions, who have supported the editorial process. And we are very proud of the expertise that they collectively bring, which we believe is unsurpassed by any contemporary innovative journal.

We are immensely grateful to our colleagues for their support and advice through the process of setting the journal up, and for the confidence they have placed in us in supporting this initiative at a time of economic uncertainty.

In the development of the Regional Innovations to date, we would like to enlist the support of a number of organisations who wish to promote this online journal to their experts. To ensure its sustainability, we would also like to invite other organisations, networks, conferences and meetings to associate themselves with the Regional Innovations. We therefore aim for the Regional Innovations to become the leading online forum to globally disseminate outstanding research papers on innovation sector in regional dimensions. Being an online periodical, the Regional Innovations is also a forum for exchange of imaginative ideas readers wish to share. Contributions of articles on innovations sector and your comments about this issue are very welcome.

To this end, if you lead, represent, or are a member of any such organisation, please contact us to offer your support and commit to promoting the Regional Innovations as a publication outlet for research undertaken by your experts.

We do hope you enjoy and benefit from the Regional Innovations! And many thanks for staying with us in 2018!

Jean-François Devemy
Editor-in-Chief

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L'INNOVATION: LE MOTEUR DU PROGRES EN MEDECINE

Abstract

Innovation in medicine is the motor for changes in treatment of diseases. The mechanism of innovation and its consequences are analyzed in the domain of cardiology. Two exemples are illustrating the total changes observed over the past 30 years: the arterial stent and the trans arterial valve (TAVI).
The initial development was not based on a traditional course: in vitro validation of a concept, animal experimentaltion and finally clinical evaluation. The success has been the result of a combination of many factors. Among them, the expectations of the patients to take advantage of non agressive techniques. Second, the drive of the bio-medical industry seeking for new markets and new domains of growth. Third the role of few individuals accepting the risks of innovation.
The consequences of innovation are huge: a change in the medical practice, new relations between different specialists, change in the hospital organization, change in the medical initial and continuous training, new modalities of the health care coverage.

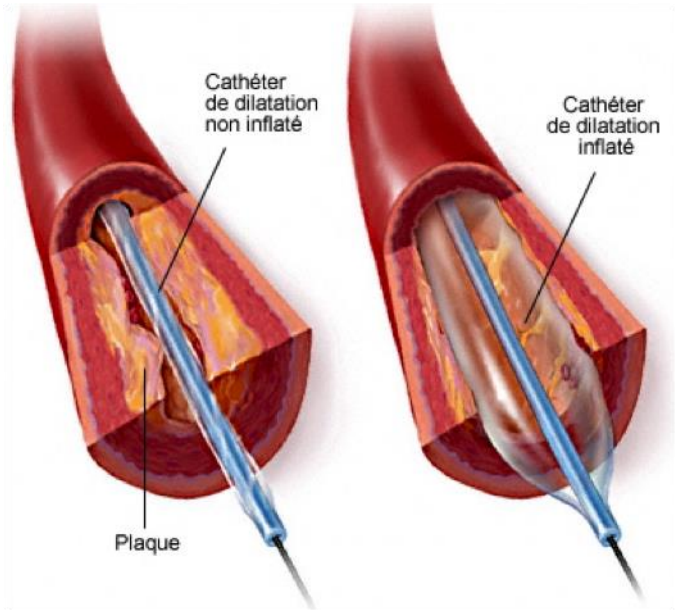
Key words: *innovation, cardilogy, clinical evaluation, health care.*

L'innovation est un processus complexe qui, d'une idée nouvelle, va aboutir à la réalisation d'un nouveau produit, d'une nouvelle technique, d'un nouveau protocole…, en passant par le long processus de validation puis d'autorisation de la mise sur le marché et l'attribution d'un prix de remboursement sans lesquelles aucune innovation ne peut être utilisée en clinique humaine. A terme, l'innovation doit permettre un meilleur résultat, à un moindre coût tant pour le malade que pour les organismes payeurs: un bénéfice plus complet, moins d'échecs ou de complications, un coût moindre. L'innovation peut procurer un avantage mineur ou totalement bouleverser les pratiques. Il peut être intéressant pour évoquer les divers problèmes que pose l'innovation de prendre un exemple, celui que connaît la cardiologie. Dans cette spécialité, une innovation est en fait à la base d'un bouleversement majeur des pratiques.

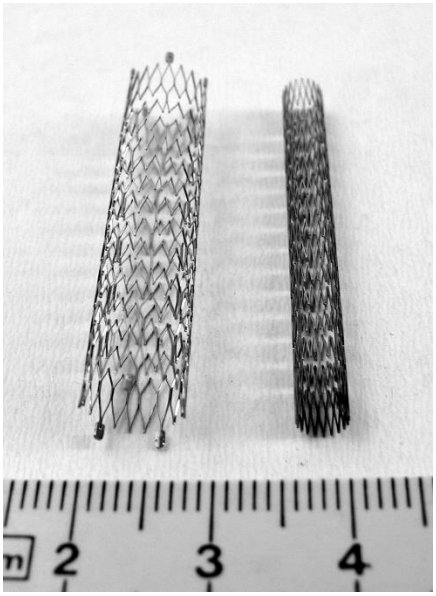
Il y a cinquante ans, la cardiologie était une science purement contemplative: elle permettait un diagnostic mais disposait de peu de moyens pour agir sur la maladie. A cette même époque, la chirurgie cardiaque se développait et pour la première fois dans l'histoire de la cardiologie permettait d'agir efficacement sur un grand nombre de maladies: corriger une malformation congénitale, réparer ou remplacer une valve défectueuse, corriger un rétrécissement ou la dilatation d'une artère. Pendant une vingtaine d'année, des années 50 à la fin des années 70, la chirurgie était le seul recours efficace pour la plus grande partie des maladies cardiaques. Ensuite, peu à peu, une succession de progrès dans la réalisation de ces gestes eux mêmes et dans l'environnement médical de la chirurgie a permis de transformer une chirurgie héroïque, aux résultats difficilement prédictibles, que l'on connaissait dans les premières années en une procédure parfaitement reproductible, sûre et efficace. Des années 70 aux années 90, la chirurgie cardiaque a connu alors son âge d'or: ne connaissant pas de 'concurrence', était bien la seule solution accessible aux malades.

Une innovation majeure est intervenue dans la fin des années 70. Il est apparu en effet possible de réaliser des gestes réparateurs par voie endo-vasculaire, c'est à dire sans ouverture du thorax du tout. L'idée est simple:

introduire par voie artérielle rétrograde, en ponctionnant une artère périphérique, un dispositif qui permet d'agir de façon efficace dans un vaisseau intra thoracique : dilater le rétrécissement d'une petite artère en gonflant un ballon et c'est l'avènement de l'angioplastie coronaire, renforcer la paroi du vaisseau en déposant un treillis métallique, un stent, et c'est le traitement durable de la maladie coronaire.



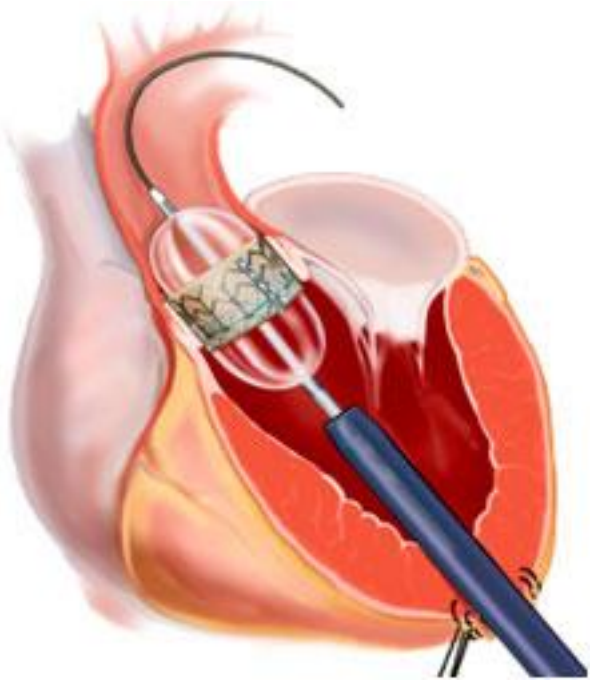
La sonde traverse la zone rétrécie. Le ballonnet dilate la lésion.



Le stent est alors apposé contre la paroi

Dans la continuité de ce qui précède, une innovation peu concevable quelques années plus tôt est apparue à la fin des années 90: une valve artificielle peut être déployée dans un orifice valvulaire malade par accès endo-vasculaire exclusif et c'est le TAVI (trans arterial valve implantation). Une valve rétrécie peut être dilatée. Les feuillets de cette valve sont impactés dans la paroi vasculaire adjacente. Sur ce socle, un stent porteur de feuillets souples peut être déployé.

Les feuillets de péricarde sont fixés sur le stent



La valve est poussée dans l'aorte, et est positionnée dans l'anneau aortique

La cardiologie interventionnelle est ainsi née grâce à deux innovations de rupture complète, le stent et le stent valvé. Le cardiologue n'a plus besoin du chirurgien pour réparer des anomalies structurelles du cœur, coronaires ou valvulaires. Pratiquement tout ce que le chirurgien faisait est désormais faisable à l'extrêmité d'une sonde par le cardiologue qui prend le nom de cardiologue interventionnel. Rapidement le concept de base est étendu à la mise en place par voie percutanée de dispositif occluant un défaut des cloisons intra cardiaques, comme une communication inter auriculaire ou une communication inter ventriculaire.

Le bénéfice pour le malade est considérable : une même réparation au prix d'un geste non invasif, faisable sous anesthésie locale en lieu et place d'une intervention majeure. Le succès de ces techniques est quasi immédiat. Le nombre d'interventions de chirurgie coronaire est en chute rapide. Des interventions de réparation valvulaire chez le sujet à très haut risque chirurgical, chez qui l'intervention souhaitée était rarement pratiquée, comme chez le malade âgé ou le malade frêle, sont désormais réalisées avec succès. Ce succès conduit à étendre les indications de ce TAVI aux malades plus jeunes, bons candidats à une intervention chirurgicale.

Il peut être intéressant de reprendre les stades tout à fait initiaux de cette grande révolution pour comprendre le succès de ces innovations dans la communauté cardiologique et chez les malades. On se rendra vite compte que toute cette évolution doit beaucoup à l'audace de quelques pionniers et à l'attente considérable des cardiologues et des malades.

Tout est parti de l'observation du changement de diamètre d'un treillis cylindrique lorsque l'on applique sur lui une traction longitudinale : au repos, sans traction aucune, le diamètre du cylindre est maximum. Sous l'effet de la traction longitudinale, le diamètre diminue. Pratiquement, une structure de grand diamètre peut être introduite dans un petit vaisseau si l'on applique une traction longitudinale puis positionnée au bon endroit et reprendre son diamètre initial en supprimant cette traction. Cette technique est à la base du traitement non chirurgical des fractures du poignet, utilisant le gant chinois. Ce gant qui engaine les doigts reste en place lorsque le bras est mis en charge du seul fait de la traction longitudinal exercée par le poids du bras. Ceci permet la réduction progressive des fractures du poignet. La grande innovation a été de comprendre les phénomènes mis en jeu par cette manoeuvre traditionnelle et d'étendre ce principe à des problèmes vasculaires.

L'étape de la validation de cette nouvelle technique a été difficile et a remis en cause bon nombre des certitudes de l'époque. De façon traditionnelle, les études ont dans un premier temps été entreprises sur des modèles in vitro : des tubes en verres dans lesquels il était possible d'observer le déploiement du stent. Dans un second temps, les études ont été réalisées chez l'animal : elles ont permis l'analyse de la tolérance de ce dispositif dans des conditions d'utilisation bien réelles, de préciser les étapes de la cicatrisation, d'observer les éventuelles complications. Il a été clairement établi que la surface interne du stent était le siège de dépositions de petits caillots , qu'une réaction cicatricielle notable se développait dans la paroi du vaisseau en regard du stent, bref des modifications qui pouvait faire craindre un risque élevé d'occlusion du stent par thrombose massive. Ce risque a été confirmé lors de la mise en place de stents dans des petites artères. Il est apparu être sans importance clinique dans les gros vaisseaux.

Clairement donc, les études expérimentales montraient que l'utilisation ne pouvait être recommandée chez l'homme que dans des vaisseaux d'un calibre supérieur à 5 millimètres. Et cependant, les premières applications chez l'homme ont été réalisées chez des malades porteurs de lésions des artères coronaires, donc sur des vaisseaux de petit calibre ! Le marché du stent était en effet dans le domaine de la coronaire. Cette considération industrielle a primé, et les premiers essais ont été réalisés chez l'homme ; De façon non surprenante, les premiers résultats ont confirmé l'important du risque d'échec : un taux d'occlusion aigue et rapide du vaisseau important. Et cependant, la présentation des premiers résultats dans le plus grand congrès de cardiologie a été accueillie avec enthousiasme!

Heureusement, et ce par le plus grand des hasards, il a été observé très peu de temps après que le traitement par l'aspirine, un puissant agent anti aggrégant plaquettaire permettait de réduire ce risque d'occlusion précoce du stent. Cette observation, quasi fortuite a en fait sauvé l'avenir du stent. Très rapidement, tous les cardiologues ont alors adopté la technique.

Quelques réfexions sur la naissance de ces innovations

Cette histoire du développement du stent coronaire est intéressante à plus d'un titre. Elle montre les limites de l'évaluation animale et le caractère extraordinairement empirique du progrès dans la connaissance. Elle montre aussi les difficultés du passage du laboratoire à l'homme : était il acceptable de proposer les premières implantations chez l'homme quand les résultats de l'expérimentation était aussi inquiétants ? Il faut bien admettre, et nous en avons été l'un des témoins, que la décision a été très orientée par les perspectives du marché : le marché potentiel du stent coronaire était jugé considérable, bien supérieur au marché dans les

vaisseaux de gros calibre ou dans les conduits non vasculaire comme l'uretère, l'urètre ou les voies biliaires. La suite des évènements a été conforme à ce que les initiateurs de la méthode pensaient : le traitement des lésions coronaires passe par la mise en place du stent.

Un second phénomène est intervenu pour consolider l'avenir du stent coronaire. A cette époque est née ce que l'on appelle « l'evidence based médecine ». De grandes études comparatives, prospectives, randomisées, c'est à dire attribuant au hasard seul le choix de l'une ou l'autre technique dans une population homogène, ont été mises en place tant en Europe qu'aux Etats Unis. Pendant très longtemps, l'absence de supériorité des résultats (en terme de mortalité, de morbidité, de nécessité de nouveaux gestes) du groupe stent par rapport à un groupe chirurgie aurait dû freiner l'enthousiasme des cardiologues et des patients, heureux d'éviter une intervention chirurgicale. En fait, l'avenir du stent était dans chaque étude consolidé par l'espoir d'un nouveau stent, qui viendrait corriger les insuffisances du stent étudié. La facilité de la répétition des gestes de cardiologie interventionnelle a fini de convaincre les plus réticents !

Le même scénario s'est déroulé à nouveau avec le TAVI. Tout faisait penser que le concept de la valve percutanée ne pouvait marcher. Le tissu valvulaire d'une prothèse valvulaire est une structure très fragile qui ne doit être manipulée qu'avec le plus grand soin. Lors d'une intervention chirurgicale, la prothèse valvulaire n'est sortie de son liquide de conservation qu'avec beaucoup de précautions, le chirurgien évite de manipuler ces feuillets fragiles. Il a même été montré que la seule exposition à l'air, le séchage des feuillets valvulaires, entraine des lésions qui compromettront le devenir de la prothèse après son implantation. Et cependant, pour préparer le TAVI, ce même feuillet valvulaire doit être comprimé sur la structure métallique du stent, pour que sa taille finale soit assez réduite pour être implantée par voie percutanée ! Le chirurgien ne peut qu'être horrifié de la façon dont le cardiologue traite cette valve. Et pourtant, de façon très surprenante, le taux de déchirure des TAVI après implantation paraît être faible ! Personne n'ose évoque les résultats à long terme. Des commentaires voisins pourraient être faits sur d'autres questions soulevées par cette innovation. Ainsi, le risque de fuite péri-valvulaire après l'implantation : la plus petite fuite péri valvulaire à un gros impact sur l'évolution du malade et cependant, dans la plus part des cas, une fuite peut être observée et celle ci serait (problème en fait à vérifier) sans conséquence ! Autre exemple enfin : le risque d'emboles cérébraux lors de la procédure. Ils seraient exceptionnels. En fait, quand on sait l'extrême friabilité des lésions de la valve, on ne peut imaginer qu'aucune particule n'est libérée lors de la dilatation ou lors de la mise en place de la valve. Il peut être intéressant de noter que les études faites par IRM cérébrales, dans les semaines qui suivent la procédure, confirment la fréquence des cicatrices, confirmant ainsi la migration de particules valvulaires ou calcaires. Or il est également connu que ces cicatrices sont un facteur d'aggravation du risque de démence ! Et cependant personne ne s'inquiète ! Ainsi, toutes les craintes que peut avoir un chirurgien sur l'avenir du TAVI seraient injustifiées et non confirmées par l'expérience, ce qui n'empêche pas les cardiologues et les malades de souhaiter cette procédure si peu invasive, pensent ils.

Ces deux exemples, celui du stent et celui de la valve percutanée, ont un point commun : une acceptation très large par le cardiologue et le malade, malgré les risques (qui souvent vont se vérifier) d'évènements indésirables. Cette acceptation en fait est la résultante du refus des techniques sûres mais perçues par le malade comme agressives. La règle est aujourd'hui de privilégier le court terme, la procédure dont le risque est le plus réduit et ce, même si le résultat doit être sub optimal, à une intervention traditionnelle sûrement plus efficace mais jugée comme trop lourde et trop risquée.

Il faut souligner un phénomène étonnant: l'espoir d'amélioration des dispositifs jugés imparfaits encourage une véritable fuite en avant: le dispositif de nouvelle génération permettra des résultats plus favorables que celui qui a été étudié et a été jugé imparfait . Ainsi, après les stents « nus » de première génération sont apparus les stents actifs (drug eluding steent) à la surface desquels sont déposés des agents pharmacologiques divers et aujourd'hui les stents biodégradables : puisque la matrice du stent pose problème à long terme, faisons en sorte qu'elle se résorbe progressivement et nous avons ainsi de bonnes chances d'obtenir une véritable restitution ad integrum de la paroi vasculaire. En fait, tout spécialiste des biomatériaux vous dira que le processus de résorption est la conséquence d'une réaction inflammatoire locale majeure et que des effets délétères de celle ci sont bien probables. `

Même histoire avec les TAVI. Après les premières générations de valves per-cutanées on voit apparaître des dispositifs au profil plus petit, plus faciles à introduire, présentant un risque de fuite péri valvulaire plus réduit, exposant moins au risque d'emboles cérébraux ou de troubles du rythme cardiaque. Toute une industrie s'est mise en place qui, dans l'espoir d'une part significative d'un gâteau de plusieurs dizaines de milliards de dollars, contribue au progrès technologique.

Un problème est rarement soulevé: celui du prix des valves percutannées. Lorsqu'elles sont apparues, le prix de remboursement accordé a été fixé au niveau du coût global d'une intervention chirurgicale tradionnelle de

remplacement valvulaire (de l'ordre de 25 000 euros) c'est à dire beaucoup plus que le prix d'une prothèse valvulaire traditionnelle (de l'ordre de 2500 euros). Cette décision était peut être dans une logique d'équivalence du service rendu. Il faut cependant bien admettre que ce prix élevé est totalement déconnecté du coût de la fabrication. Et cependant, personne n'a été choqué. On peut penser que ce coût élevé a aidé au développement de nombreuses petites start up, qui après un investissement modeste était achetée par les « majors » de l'industrie bio médicale à des prix considérables (de l'ordre du demi milliard de dollars).

Des bouleversements en cascade

Les conséquences de ces innovations, le stent et le stent valvé, les techniques endo vasculaires en général, sont considérables, et ce dans divers domaines.

Celui de l'imagerie médicale tout d'abord. L'essor des techniques endo vasculaires a suscité une recherche très intense. Les géants de l'industrie comme Siemens, General Electric et Phillips ont conduit une recherche très pointue aussi bien sur les techniques échocardiographiques que radiologiques et sur l'IRM. Aujourd'hui, la qualité des images est exceptionnelles et permet des vues endo-vasculaires extrêmement précises. En outre, ces nouvelles techniques d'imagerie permettent d'évaluer de façon non invasive la signification fonctionnelle d'un rétrécissement, les perturbations de l'écoulement du sang dans les vaisseaux. Un véritable planning pré-opératoire est désormais possible qui réduira le risque lié à l'irradiation, permettra plus de précision et de sûreté lors de la manoeuvre endo-vasculaire.

Le second bouleversement se situe dans l'évolution des relations entre cardiologue médecin et cardiologue chirurgien. Toutes ces techniques font appel à un geste vasculaire, la ponction de l'artère périphérique, ce qui justifie la présence du chirurgien lors de la mise en place d'un TAVI. Plus important est le fait que la mutiplicité des techniques aujourd'hui disponible chez un malade donné justifie que la décision soit prise de façon partagée. Les techniques chirurgicales et les techniques endo-vasculaires ne doivent pas être concurrente mais complémentaires. C'est le rationnel de la Heart Team, où chacun, évitant une guerre des égos, choisira le traitement optimal dans une situation donnée.

Autre bouleversement, en cours : l'organisation hospitalière. La proximité voir l'intrication croissante des techniques chirurgicales remet en cause la notion de service hospitalier, médical ou chirurgical et l'organisation des plateaux techniques. Jusqu'à présent, le bloc opératoire est individualisé et séparé du plateau d'imagerie. Aujourd'hui, tout est réuni dans un même lieu, la salle d'opération hybride, où les techniques per cutanées et une intervention chirurgicale traditionnelle peuvent se combiner, voire se succéder. Cette réunion en un même lieu de moyens lourds n'est pas sans poser problèmes dans la gestion et la vie de blocs opératoires communs, ou dans des hôpitaux qui continuent à fonctionner «en silôts».

Salle d'opération hybride, équipée pour la cardiologie interventionnelle ou la chirurgie cardiaque traditionnelle

Il est évident également que les évolutions des pratiques directement conséquence des développements des techniques per-cutanées imposent une modification des protocoles de formation des spécialistes. Les maquettes de formation des chirurgiens et des cardiologues doivent prendre en compte ces évolutions. La rapidité des évolutions impose par ailleurs de revoir les obligations et les procédures de formation continue.

Dernier bouleversement à venir mais bien probable: la modification des modalités de la prise en charge par les organismes payeurs, des frais engagés. Jusqu'à présent, le paiement à l'acte prévaut. Faut il, peut on, continuer de cette manière quand un résultat voisin peut être obtenu par l'une ou l'autre technique, quand le choix de la technique est partagé par le médecin et le chirurgien, quand la technique est appliquée par un tandem médecin-chirurgien. L'évolution dans ce contexte nouveau se fait vers la notion de paiement forfaitaire lié à la valeur ajoutée.

Pour conclure, une innovation technologique en première analyse sans grande conséquence d'autant qu'elle n'etait pas véritablement validée a conduit à un bouleversement considérable des possibilités de traitement et des pratiques en cardiologie. L'un des grands moteurs de cette évolution a été l'attente des malades et leur gêne à accepter facilement une intervention chirurgicale importante. Le rôle de l'industrie bio-médicale et l'ampleur des marchés potentiels sont peu discutables.

TELEMEDICINE IN THE SYSTEM OF HEALTH CARE IN UKRAINE: REALITIES AND PROSPECTS

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Abstract

Information and communication technologies have resulted in the appearance of telemedicine that at the present stage involves actually all services in the system of Ukrainian health care, including pathological anatomy, and is a highly effective instrument, which makes it possible to increase opportunities for realizing human rights to receive accessible medical aid of high quality, and to raise the level of knowledge and skills of Ukrainian specialists.

Key words*: telemedicine, health care system, Ukraine.*

Today modern information and communication technologies define the vector and rate of development of health care systems in different countries of the world, and their application has resulted in the appearance of such a branch of medicine as telemedicine [1]. Taking into account the rapid pace of development of information and communication technologies in the world, telemedicine is a continuously developing medical branch, which reacts and adapts to changing requirements in the field of health protection [2].

The term «telemedicine» (Greek «tele» – distance, Latin «mederi» – treatment), introduced into the scientific use by T. Bird (1970) and R. Mark (1972), unites numerous telecommunication methods for providing medical information and services and conducting interactive videoconsultations between medical centers using satellite communication [3].

The World Health Organization defines the concept of «telemedicine» in the following way: "The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" [4].

At present, telemedical projects are divided in the world by their character into clinical, educational, informative and analytical, and by their geographical extent into local, regional, national and international [3].

The beginning of development of telemedicine in Ukraine is linked with 1940, when researches were made within the framework of space projects. In 1994 negotiations were conducted with international specialists for introduction of telemedicine in Ukraine and the first teleconsultations were performed. The first telemedical centre in Ukraine was founded in 2000 on the basis of the Donetsk Research Institute of Traumatology and Orthopaedics. In 2006 the Association for Ukrainian Telemedicine and eHealth Development was established. The State Clinical Research Telemedicine Centre of the Ministry of Health of Ukraine was founded in 2007; this is the only specialized health care institution aimed at introduction and development of telemedicine in Ukraine [5].

The telemedicine-associated activity of medical-prophylactic institutions in Ukraine is regulated by the Fundamentals of Health Legislation and related orders of the Ministry of Health.

Nowadays telemedicine has a wide variety of technological solutions and processes, which make it possible to exchange medical data in local, regional and global telecommunication networks for solving different problems in the field of health care (diagnosis, treatment, education, science, management) [6].

In Ukraine telemedicine is one of effective methods for improving the accessibility and quality of giving health care to both urban and, especially, rural population, taking into account a lack of medical personnel in villages. Telemedical technologies make unnecessary the presence of specialists at their workplaces in real time and make it possible to carry on remote consultations of doctors and their patients, who are in different areas of the planet.

There are several variants for cooperation of users in the sphere of telemedicine: "on-line" (videoconferencing: synchronous or dialogue); "off-line" (consultations: delayed, postponed or by correspondence); telemetry (means for transmitting biological signals); combined customer interaction [7].

Telemedicine uses such technologies as teleconsultation, teleeducation, telemonitoring, telelecture, teleseminar, telemedical conference, medical teleconsultation, telesymposium [6].

In Ukraine, unfortunately, the process of introduction and improvement of telecommunication technologies in the system of health care does not take place as rapidly as, for example, in the USA, Norway, Great Britain and Greece, which are leading countries in introduction of telemedicine [8]; this fact is caused by existing economic, organizational, technological and other problems. For instance, the economic cause is basic because the organization of the telemedical service requires heavy material expenses for buying equipment and programs, laying network cables, paying for work, etc. At present, the following models of payment are usually distinguished: free (on the charitable and collegial basis) and paid («payer – patient», «payer – state») [3]. The first model is more common in the Ukrainian health care, as a result causing the problem of a lack of medical personnel that could provide telemedical services.

Introduction of telemedicine in the health care system presupposes training of highly experienced doctors, who would be both professionals in their fields and have skills in work with modern information and communication technologies.

Taking into account that telemedicine is an integral component of the system of health care, it necessitates standardization of medical technologies in order to improve its quality [3].

At present, information and communication technologies are used in different medical branches, including pathological anatomy, with a resultant appearance of a modern field called telepathology and its active introduction into practice. The term «telepathology» was introduced in 1980 by R. Weinstein, who understood it as a remote analysis of pathological processes, the images being studied with help of a computer monitor.

Telepathology makes it possible to analyze pathological processes at a distance using computer and

telecommunication technologies, when the macroscopic picture and microscopic changes are displayed on the computer monitor and can be transmitted at different distances with diagnostic and consultative purposes [9].

Telepathology is of great importance: firstly, in morphological diagnosis of rare and difficultly diagnosed diseases, making it possible to scan fully a microslide, send it to another city or country and get feedback from experienced specialists in the same country or abroad; secondly, in improving the level of knowledge of the country's pathologists by means of remote training. This field is also used for diagnosing atypical cases in presence of pathomorphosis of a disease; in making morphological examinations without pathologists; when it is necessary to control the course of a morphological examination, to hold a case conference, etc.

The development of telepathology both in other countries and Ukraine results in the appearance of some problems, including adequacy of the image to the original picture on the microslide, accuracy of histological findings as a whole, a possibility for a consultant to examine microslides at a distance independently, a necessity to make microslides of high quality, terms and classifications in case of consulting by pathologists from other countries, etc. [10].

Taking into consideration the operating mode of remote examinations of microslides, telepathology is divided into static and dynamic.

In the static operating mode images are transmitted via communication lines to the consulting telepathologist's computer in the form of separate frames, selected by the doctor. This method with use of an optical microscope and a digital camera is most easily realized and requires insignificant material expenses. Transmission and review of images can be performed at the time, which is convenient for the doctors. The consultant does not participate in the selection of visual fields of specimens, but analyses separate image frames. The main disadvantages of static telepathology are as follows: dependence of the diagnosis reliability upon the selection quality of the visual fields of microslides and upon the quantity of these fields, a slow preparation of data, difficult use.

In the dynamic mode the work is done "on-line": the consulting telepathologist reviews the specimen, which is on the microscope stage, and at the same time he can instruct by telephone the doctor, who is on the other end of line, to move the specimen or leave it in some definite place. Dynamic telepathology is diagnostically more valuable versus static one. The pluses of work in this mode consist in the possibility for the consultant to select independently visual fields and magnifications in the process of examination of microslides, heavy material expenses being the main disadvantage of dynamic telepathology [11, 12].

As can be seen from the above, information and communication technologies have resulted in the appearance of telemedicine that at the present stage involves actually all services in the system of Ukrainian health care, including pathological anatomy, and is a highly effective instrument, which makes it possible to increase opportunities for realizing human rights to receive accessible medical aid of high quality, and to raise the level of knowledge and skills of Ukrainian specialists.

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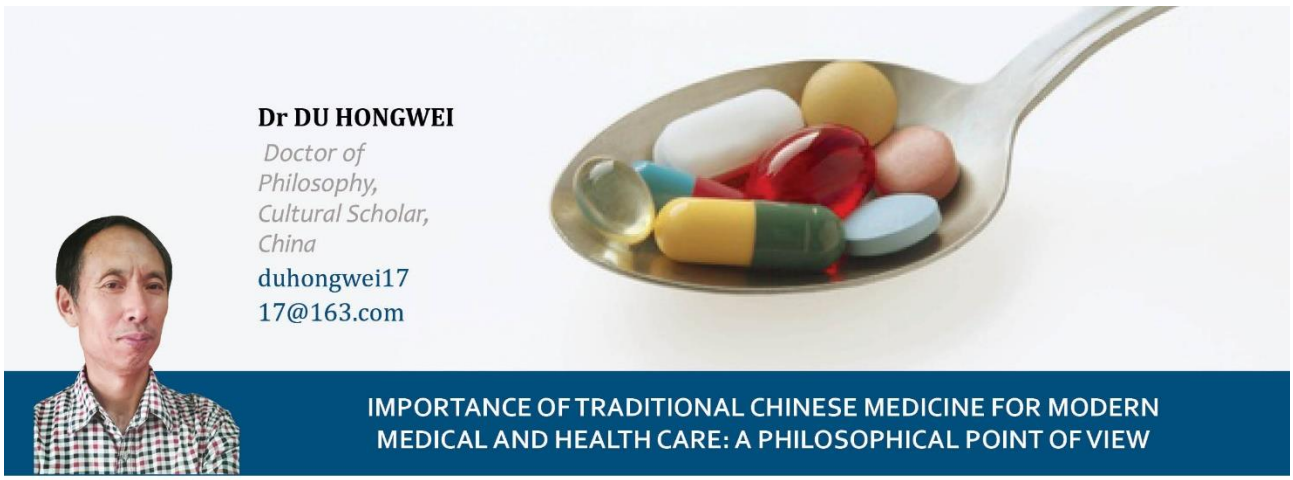

从哲学角度看中国传统医学对现代人类医疗与保健的重要意义

杜宏伟　哲学博士

Abstract

Modern technology can not help humans get rid of diseases. Thousands of people die of various diseases every year. Chinese traditional medicine has lasted for thousands of years and accumulated rich medical and health care experience, which can make up for the shortcomings of modern medicine. Drawing lessons from the balance and harmony theory of ancient philosophy, traditional Chinese medicine established the theory of meridians and collaterals, regarded the human body as an organic system, and viewed the emergence and cure of diseases from a systematic perspective. Traditional Chinese medicine advocates natural therapy, and uses natural herbs and acupuncture to cure diseases. Combining the biological clock, energy field and spiritual factors, we have formed a mature theoretical system and practical experience.

摘要

现代高科技还不能帮助人类摆脱疾病困扰。每年有成千上万人死于各种疾病。中国传统医学延续了上千年历史，积累了丰富的医疗和养生经验，可以弥补现代医疗的不足。中国传统医学借鉴古代哲学的平衡思想与和谐理论，创建了经络说，把人体看做一个有机系统，从系统的角度看待疾病的产生与治愈。中医主张自然疗法，利用天然草药和针灸手段治愈疾病。并结合生物钟，能量场和精神因素综合看待健康问题，形成了成熟的理论体系和实践经验。

Key words: *traditional medicine, balance theory, natural therapy, meridian theory, system theory, energy field, spiritual values, integration of traditional Chinese and Western medicine, futurology.*

关键词：*传统医学，平衡理论，自然疗法，经络学说，系统论，能量场，精神价值观，中西医结合，未来学。*

1. The limitations of modern western medicine and the potential of TCM.

Modern medicine is developing with the help of scientific and technological progress. Although high-tech has been developed, medicine has not yet solved the problem of human diseases. According to the latest statistics released by WHO, every year 650,000 people

1，现代西医的局限性与中医的潜力

现代医学是借助科技进步而不断发展的，虽然高科技已十分发达，但医学还没有解决人类疾病问题。据世卫组织发布的最新统计：每年有65万人因呼吸道感染而死亡，有超过1000万人死于结核病，每年大约100万的患者死于乙肝相关疾病，有1500万人

die of respiratory tract infections, more than 10 million people die of tuberculosis, about 1 million people die of hepatitis B-related diseases, 15 million people die of cardiovascular and cerebrovascular diseases, and nearly 1 billion people suffer from hypertension. At the same time, some modern treatment technologies also have drawbacks, such as the circulatory system hidden dangers caused by heart stents, the harm of overflow of painkillers to public health, and so on.

死于心脑血管疾病，有近十亿人患高血压病。同时，一些现代治疗技术也存在弊端，如：心脏支架带来的循环系统隐患，止痛药泛滥对大众健康的危害，等等。

Western medicine treats the isolation of disease rather than the root cause, eliminating symptoms rather than diseases. Many patients with chronic diseases, especially cancer patients, because of long-term drug use, human organs can not withstand the side effects of drugs, and eventually die in the treatment process. Recently, Canadian medical experts found that long-term use of antihypertensive drugs had cancer risk (including hazardous ingredients ACEIs). The limitations of modern medicine compel us to re-recognize the value of traditional medicine, especially the experience of traditional Chinese medicine in disease prevention and treatment of chronic diseases. Traditional Chinese medicine has accumulated thousands of years of experience and has irreplaceable advantages. In theory, TCM is rooted in the deep soil of Chinese traditional philosophy and health culture, and has special practical value in improving human health quality and prolonging life span. It can make up for the deficiency of Western medicine.

西医治疗的是疾病的孤立现象而不是根本病因，消除的是症状而不是病。很多慢性病患者，尤其癌症患者由于长期用药，人体器官不能承受药物的副作用，最终死于治疗过程。最近，加拿大医学家发现长期服用降压药有致癌风险（含危害成分ACEIs）。现代医疗的局限性迫使我们重新认识传统医学的价值，尤其中医在疾病预防和慢性病治疗方面的经验值得借鉴。中医学积累了几千年的经验，具有不可替代的优势。从理论上讲，中医植根于中国传统哲学和养生文化的深厚土壤之中，在提高人类健康质量、延长寿命方面具有特殊的实用价值。它可以弥补西医的不足。

The theory of Zhouyi in ancient China and the theory of Yin-Yang transformation of Taoism have an important impact on TCM: emphasizing the balance, harmony and harmony between man and nature. Traditional Chinese medicine regards restoring the immunity of patients as the principle of treatment. The natural therapy promoted stimulates the healing instinct of the human body itself. Chinese medicine believes that human diseases are caused by the destruction of homeostasis. Irregular living habits, such as excessive drinking, overeating, lack of exercise, lack of sleep and other factors can cause organ overload, destroy the balance of the body, and lead to disease over time. Traditional Chinese medicine mainly uses herbal medicine, massage, acupuncture, massage, scraping, cupping, guidance and dietary therapy, most of which have no side effects.

中国古代周易理论，道家的阴阳转化学说对中医产生重要影响：强调平衡之道，和谐之道，重视人与自然的协调。中医把恢复患者免疫力作为治病的原则，推行的自然疗法激发了人体自身的治愈本能。中医认为，人的疾病是由于体内平衡遭到破坏造成的。不规律的生活习惯，如：过量饮酒，暴饮暴食，缺乏运动，睡眠不足等因素都会造成器官负担过重，破坏机体平衡，日久导致疾病。中医治疗主要采用草药，推拿，针灸，按摩，刮痧，火罐，导引和食疗等手段，绝大多数是没有副作用的。

Because traditional Chinese medicine treats the causes of disease, many diseases can be cured. Modern medical fees are expensive, and many diseases are only affordable to the rich. The cost of traditional Chinese medicine treatment is low, and ordinary people can also enjoy it.

由于中国传统医学治疗的是疾病的原因，所以，很多疾病能够得到根治。现代医疗收费昂贵，很多疾病只有富人看得起。而中医治疗成本低，普通人也能享用。

The motto of Chinese medicine is: good doctors are not famous because they do not let people get sick.

中医的格言是：好的医生是不出名的，因为他不让人生病。预防疾病是中医的长处。现代社会正进入

Prevention of disease is the strength of TCM. Modern society is entering the era of health care. The focus of medical care is shifting from disease to prevention and health. The preventive advantages of TCM will save huge medical expenses for the welfare society.

健康医疗时代，医疗重心正由关注疾病转向关注预防、关注健康。中医的预防优势会为福利社会节省巨大的医疗开支。

2. The contribution of meridian theory to medicine.

2，中医经络说对医学的贡献

The meridian theory of traditional Chinese medicine regards the human body as a complex energy field. The organs exchange information through special channels and interact with each other. This channel of energy transmission is called meridians. It is a network that runs through the body besides the blood vessels and nervous system. There are 24 meridians throughout the body, and each meridian is associated with several organs. Organs that are located on the same meridian will interact with each other. There are several nodes on each meridian, that is, acupoints. There are nearly 1000 acupoints throughout the body. There are 365 main acupoints commonly used. By stimulating the acupoints to adjust the corresponding organ state, relieve the disease and restore the body balance. Scientific research has found that each internal organ has related acupoints, and the reflection points are distributed on the surface of the body. For example, the reflex points of the heart, kidney or liver can be found on the sole of the human foot, and there are acupoints corresponding to the whole body on the ear. Chinese medicine achieves the aim of curing diseases through massage or acupuncture.

中医的经络理论把人体看做复杂的能量场，器官之间通过特殊渠道进行信息交换，相互影响。这个传递能量的渠道叫经络。它是除了血管和神经体系之外贯穿全身的网络。全身有 24 条经络，每条经络都关联着若干器官。处在同一条经络上的器官之间会相互影响。每条经络上分布着若干节点，即穴位。全身有近 1000 个穴位，常用的有 365 个主要穴位。通过刺激穴位调节相对应的器官状态，缓解病症，恢复机体平衡。科学研究发现，每个内脏器官都有相关的穴位构成反射点分布在身体表面。比如：在人的脚底可以找到心脏，肾脏或肝脏等内脏器官的反射点，在耳朵上也有与全身部位对应的穴位。中医通过按摩或针灸这些穴位达到治病的目的。

In practice, traditional medicine has established methods of hand-foot correlation, distal acupoint selection, treatment of upper and lower diseases and treatment of lower diseases. For example, Chinese medicine will treat the sprain of the leg muscles by massaging the upper arm points.

实践中，传统医学创立了手足相关法，远端取穴法，上病下治和下病上治等方法。比如：中医会通过按摩上臂的穴位治疗腿部的肌肉扭伤。

Using the systematic thinking of meridians, Chinese medicine will accurately identify the cause based on symptoms. For example: some eye diseases are caused by liver diseases, tinnitus or soft waist and legs may be kidney problems. Because liver and eye, kidney and ear on the same meridian, they have relevance.

利用经络的系统思想，中医会根据症状准确找出病因。比如：有些眼疾是肝脏系统疾病引起的，出现耳鸣或腰酸腿软等现象可能是肾脏出了问题。因为肝与眼，肾与耳在同一条经络上，它们有相关性。

3. The meridian streamline and biological clock thought of TCM.

3，中医的子午流注与生物钟思想

Chinese traditional culture divides a day into 12 hours, each time equivalent to 2 hours. Traditional Chinese medicine has found that the state of the human body is strong and weak at different times, with periodic fluctuations. This change is also a factor affecting health. The theory that TCM chooses treatment method according to time factor is called meridian flow theory, which is the earliest biological clock thought. According to the philosophy of harmony between man

中国传统文化把一天分成12个时辰，每个时辰相当于2个小时。中医学发现人体状态在不同的时辰有强弱变化，有周期波动。这种变化也是影响健康的因素。中医根据时间因素选择治疗方法的理论称为子午流注说，是最早的生物钟思想。根据天人合一的哲学思想，中医认为人体能量的变化与自然运行周期是一致的，主张人要遵循太阳升起降落的时间安排起居。包括练习功夫，内服草药，夫妻同房等

and nature, TCM holds that the change of human energy is consistent with the natural operation cycle, and advocates that people should follow the time schedule of the rising and falling of the sun. Including practicing kung fu, taking herbal medicine, couples and other activities have the best time to choose. Meridian flow theory adds time dimension to the meridian theory of traditional Chinese medicine, which makes the medical scheme more accurate and close to the reality of human body. Modern science has proved that human physiological state is cyclical. The winners of the Nobel prize in biology medicine in 2017 revealed the close relationship between biological clock and human health. Modern people have learned to use biological clock theory to improve work efficiency. For example, most international sports competitions are held in the afternoon or evening, during which people are in the best state of motion, while schools often set foreign language classes in the morning, because people have high memory efficiency in the morning. Medical discoveries show that life energy is the lowest in the period before dawn, when certain diseases are in crisis.

活动都有最佳时间选择。子午流注说为中医的经络理论增加了时间维度，让医疗方案更精准的接近人体现实。现代科学证明了人的生理状态具有周期性。2017年诺贝尔生物学医学奖获得者揭示了生物钟与人类健康的密切关系。现代人早已学会利用生物钟理论提高工作效率。比如：国际体育比赛大多选在下午或晚上，这段时间人的运动状态最好，而学校常将外语课设在上午，因为早上人的记忆效率高。而医学发现，在黎明之前这段时间人的生命能量最低，是某些疾病出现危机的时段。

4. Environmental awareness and energy theory of Chinese medicine.

Geomantic omen in Chinese traditional culture is a typical philosophical system. Traditional Chinese medicine combines feng shui theory and believes that there is energy exchange between man and nature. Modern science has proved that human beings are in the cosmic energy field all the time: the activities of the sun spots, cosmic rays, and the earth's magnetic field are closely related to human health. Geographical conditions, surroundings, housing structure and the position of people in the room also have energy significance. The Chinese call this energy characteristic geomantic omen. It can affect people's health, mood and luck. When we live in different areas of the city and in different buildings, factors such as the color of the room, the direction of the windows and the location of the bed will have undetectable implications into the subconscious, which will affect our thinking and physiological functions, and will affect our behavior. Traditional Chinese medicine integrates geomancy and puts human health problems into the energy system of time and space for comprehensive analysis. For example, people are prone to illness when changing their residence, traveling or traveling. Traditional Chinese medicine believes that it is the change of geographical environment and energy field that has an impact on health.

4，中医的环境意识与生命能量理论

中国传统文化中的风水学是有代表性的哲学体系。中医融合了风水学思想，认为人与自然之间存在能量交换。现代科学证明，人每时每刻都处在宇宙能量场中：太阳黑斑活动，宇宙射线，地球磁场都与人的健康有密切关系。人所处的地理条件，周围环境，房屋结构，人在房间中的位置也具有能量意义，中国人把这种能量特性称为风水。它能影响人的健康，心情和运气。当我们住在城市的不同区域，处在不同的建筑物里时，房间的颜色，窗子的方向和床的位置等因素会有觉察不到的暗示进入潜意识，会作用在我们的思维判断和生理机能中，会影响我们的行为方式。中医便是融合了风水学的思想把人的健康问题放在时间和空间的能量系统中加以综合分析。比如：改换住处，出差或旅行时人容易生病，中医认为这是地理环境和能量场的改变对健康产生了影响。

5. The significance of TCM diet therapy in reality.

Diet therapy is a traditional Chinese medicine treatment method, widely used in the folk. Chinese culture is influenced by Buddhism and has a vegetarian

5，中医的饮食疗法在现实中的意义

饮食疗法是中国传统医学的一种治疗手段，在民间广泛采用。中国文化受佛教影响，在饮食习惯上有

tradition in eating habits. Chinese medicine also advocates a light diet, Promoting Vegetarian and meat matching. Chinese medicine believes that the food we eat every day is medicine, and we should choose the right food according to our physical condition and nutritional needs. Chinese medicine often recommends foods that enhance immunity. Cancer is the highest death rate in the world, and the incidence of cancer in elderly population is even higher. In recent years, environmental pollution and air pollution in China have posed a great threat to people's health, and the carcinogenic factors are far more than those in European and American countries. Moreover, China has entered an aging society, but the incidence of cancer in China ranks 70th in the world, and the top 20 are all developed countries in Europe and the United States. This is related to many factors, including eating habits and lifestyle. Cardiovascular and cerebrovascular diseases, hypertension and diabetes are rare in longevity regions such as Hainan and Guangxi. Local residents have been eating rice, vegetables and fish for generations. The local people are rich in fruits and have the habit of drinking tea. The pace of life in Hainan and Guangxi is relatively slow. They maintain the living habits of early rising and late returning from farming culture, and their interpersonal relationships are very friendly and harmonious. Some more than 90 year old people are still thinking clearly and moving freely. They followed the traditional way of life throughout their lives. Quit smoking, not greedy.

素食传统。中医也主张饮食要清淡，提倡素食和肉食合理搭配。中医认为，我们每天吃的菜就是药，应该根据身体状况和营养需求选择合适的食物。中医常常向患者推荐用以提升免疫力的食品。癌症是目前世界死亡率最高的疾病，而老年群体癌症发生率更高。中国近年的环境污染和空气污染对民众健康造成很大威胁，致癌因素远多于欧美国家。而且，中国也进入了老年化社会，但中国癌症发病率在世界排名第70，排名前20名的均是欧美发达国家。这与很多因素有关，其中，饮食习惯和生活方式起到了重要作用。在中国海南和广西等长寿地区很少发生心脑血管疾病，高血压和糖尿病。当地居民世代以米饭，青菜和鱼肉为主要饮食，当地水果丰富，并有饮茶习惯。海南和广西等地区生活节奏较慢，保持着农耕文化早出晚归的起居习惯，人际关系也非常友好融洽。一些90多岁的老人仍思维清晰，行动自如。他们一生遵循传统的生活方式。戒烟酒，不贪婪。

Among the anti-cancer and anti-aging foods recommended by WHO, traditional Chinese foods such as green tea, grains, beans, vegetables and fruits, especially onions, ginger, garlic, pepper and curry seasonings, are commonly eaten by Chinese people. In addition to dietary content, TCM also emphasizes the importance of meal time, frequency and quantity for health. It often cures some chronic diseases by changing dietary structure.

在国际卫生组织推荐的防癌抗衰老食品中，包括了中国常用传统食品，如：绿茶，各类谷物，豆类，各类蔬菜和水果，尤其是能提升免疫力的葱，姜，蒜，辣椒和咖喱类调料都是中国人日常食用的。除了饮食内容，中医也强调了用餐时间，次数和数量对健康的重要意义，常常通过改变饮食结构来治愈一些慢性疾病。

6. The position of ancient Chinese spiritual values in TCM treatment.

6，中国古代精神价值观在中医治疗中的位置

Modern medical research shows that 80% of human diseases are related to emotion. In Buddhism's view, ideology is also energy. People's starting thoughts are all energy output. Inner greed and jealousy can make people tired. Emotional disorders can hurt the body. Traditional Chinese medicine also believes that negative emotions are the main cause of disease. Medical research has proved that emotions are closely related to endocrine. For example, panic can change the secretion of adrenaline and serotonin. Happiness and love can promote the secretion of dopamine in the brain and enhance immunity. Traditional Chinese medicine holds that anger, quarrel, depression and long-term mental stress can make the body secrete

现代医学研究表明：人的80%疾病与情绪有关。在佛教看来，思想意识也是能量，人的起心动念皆是能量输出，内心的贪婪嫉妒会让人身心疲惫。而情感的失常会伤及身体。中国传统医学也认为负面情绪是疾病的主因，医学研究证明了情绪与内分泌有密切关系，如：惊恐会改变肾上腺素和血清素的分泌，快乐和爱情能够促使大脑多巴胺的分泌，能增强免疫力。中国传统医学认为：发怒，争吵，抑郁，长期精神压力会使体内分泌有害物质，会使免疫力下降。从经络的理论看，焦躁容易伤肝，忧伤容易伤肺，暴怒容易伤心，生气容易伤脾胃等等。中医把生命看作一个精神与生理相互关联的综合系

harmful substances and reduce immunity. From the theory of meridians and collaterals, anxiety is easy to hurt the liver, grief is easy to hurt the lung, anger is easy to hurt the heart, anger is easy to hurt the spleen and stomach and so on. Traditional Chinese medicine regards life as a comprehensive system of spiritual and physiological interrelationship. It is also a therapeutic method of traditional Chinese medicine to calm patients'emotions. With the help of patients' trust in doctors, psychological counseling can be achieved by talking with patients. Some symptoms that arise from psychological factors can be eliminated by emotional improvement.

统，平缓患者的情绪也是中医的治疗手段，借助患者对医生的信任，通过与患者的交谈实现心理疏导的作用。有些由心理因素出现的病症会因情绪的改善而消除。

Traditional Chinese medicine holds that people with good hearts are more likely to be happy. Buddhism emphasizes compassion. Confucianism advocates loving others as yourself. Taoism holds a natural attitude towards people. All these viewpoints contribute to the cultivation of human morality and mental health.

中医认为心地善良的人更容易快乐，佛教讲慈悲心，儒家提倡爱人如己，道家对人对事抱有顺其自然的态度。这些观点都有助于培养人的道德修养，有益心理健康。

The characteristics and physiological rules of modern human body are not much different from those of human beings 500 years ago and 1000 years ago. But modern human life style, diet structure, interpersonal relationship and psychological state are not only different from 1000 and 500 years ago, but also from 100 and 50 years ago. Human beings, ethically, physically and spiritually, are unable to adapt themselves to the modern environment of high technology. This physiological and psychological imbalance can also cause diseases.

现代人类的机体特性和所要求的生理规律与500年前、1000年前的人类没有大的区别。但现代人类的生活方式、饮食结构、人际关系、心理状态不仅不同于1000年和500年前，甚至不同于100年前和50年前。人类在伦理上，生理和精神上都来不及适应高科技构成的现代化环境。这种生理、心理上的不适应也会引起疾病。

Therefore, in pursuit of scientific and technological progress, civilized society should pay more attention to the growth of human mind. We should regard healthy living as real success.

所以，文明社会在努力追求科技进步的同时，更应该关注人类心灵的成长。应该把健康的活着看做真正的成功

7. The bottleneck of TCM development.

7，中医发展的瓶颈

Modern western medicine has studied pathological problems at the cellular level and molecular level. Because of the limitation of science and technology, traditional Chinese medicine can not make accurate diagnosis like western medicine, nor can it do cutting-edge operations such as organ transplantation and trauma rescue. The knowledge system of traditional Chinese medicine is still limited to individual experience, which can not be standardized and quantified, so it is difficult to accurately inherit, and it is difficult to train students in batches. Chinese medicine is more like philosophy and art. It requires personal savvy. Like all traditional cultures, many talented young people are more willing to engage in Western medicine, and there are fewer and fewer real doctors of Chinese medicine.

现代西医已在细胞层面和分子层面研究病理问题。由于科技水平的局限性，中医不能向西医那样做精确诊断，也不能做器官移植和创伤抢救等尖端手术。中医的知识体系还局限在个体经验中，不能标准化和量化，因此很难准确传承，很难批量培养学生。中医更像哲学和艺术，需要个人的悟性，人才可遇而不可求。像所有的传统文化，很多有才华的年轻人更愿意从事西医，真正的中医大夫越来越少。

Summary:

1. Traditional Chinese medicine holds that human beings are the product of nature, and that human diseases are also caused by natural laws. Therefore, the treatment of diseases should conform to natural laws. Traditional Chinese medicine is a theory that compromises with natural laws.
2. Meridian theory regards human as an organic life system. It looks at the emergence and cure of diseases from the perspective of balance and harmony of organism, which embodies the ideas of modern system science, dissipation theory and holographic theory. Traditional Chinese medicine analyses the system of human life in natural and cosmic systems. Introducing the concept of energy field and biological clock increases the dimension of human beings' view of life system.
3. Personalized treatment is the advantage of traditional medicine. For the same disease, TCM will formulate different medical plans according to different patients. The prescription, dosage and material selection of herbal medicine will vary from person to person.
4. Buddhist philosophy holds that all things are born in the heart, and human diseases are also caused by heart diseases. Chinese traditional medicine attaches great importance to the relationship between human spirit and disease. It also acts as psychological counseling in the process of inquiry, stimulates the enthusiasm of patients to treat diseases, and regards patients as the main body of disease treatment, not only the object.
5. More and more Europeans are receiving TCM treatment. Traditional Chinese medicine is a valuable heritage of human culture and a future discipline.

The clinical value and scientific value of TCM deserve further study, such as the clinical significance of pain points in meridian theory, the relationship between acupuncture and neuroscience, the inspiration of meridian science to life science and brain science, etc. Especially the thinking method of TCM is the real philosophy of life, which inspires us to re-interpret the significance of life to existentialism, absolute spirit and ontological philosophy from the relationship between health and consciousness.

Understanding the value of traditional Chinese medicine and making it benefit human health and mental health is an important mission we must undertake. Integration of traditional Chinese and Western medicine is the direction of future medical development.

总结：

1. 中国传统医学认为人是自然的产物，人生病也是自然规律造成的，因此，治疗疾病也要顺应自然规律。中国传统医学是与自然规律妥协的理论。
2. 经络理论把人看做一个有机的生命系统，它从机体平衡与和谐的角度看待疾病的产生与治愈，体现了现代系统科学，耗散理论和全息理论的思想。中医把人的生命系统放在自然和宇宙的大系统中综合分析。引入能量场和生物钟的概念，增加了人类看待生命系统的维度。
3. 个性化治疗是传统医学的优点。同样的病，中医会根据不同的病人制定不同的医疗方案，草药的配方，剂量和选材也会因人而异。
4. 佛教哲学认为万物生于心，人的疾病也是心病引起的。中国传统医学重视人的精神与疾病的关系，在问诊过程中兼作心理疏导，激发患者治病的积极性，把患者当做疾病治疗的主体而不仅是对象。
5. 越来越多的欧洲人在接受中医治疗。中医是人类文化的宝贵遗产，也是未来学科。

中医的临床价值和科学价值都值得深入研究，比如经络理论中痛点的临床意义，针灸与神经科学的关系，经络学对生命科学和脑科学的启发等等。尤其中医的思想方法是真正的生命哲学，它启发我们从健康与意识的相互关系中重新解读生命对存在主义，绝对精神和本体论哲学的重要意义。

认识中医的价值，让中医为人类身体健康和精神健康造福是我们必须担负的重要使命。中西医结合是未来医学发展方向。

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PROTEOMICS IN CLINIC AND KIDNEY DISEASES INVESTIGATION

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Abstract

Modern diagnostic tools are now widely fulfilled with the omics science development, which is a field of studies of different molecular classes by means of genome, proteome or metabolome investigation. In clinic the techniques can be both applied on tissues or body fluids providing a high accessibility to possible analytes aiming to discover diagnostic and prognostic markers with possible invasion avoidance.

Key words: *Omics, proteomics, MALDI-MSI, CKD.*

The emerging technologies and discoveries in medicine continuously move us towards expanding our knowledge of the diseases' nature and pathogenesis. Omics sciences is one of the relatively new fields, that recently gets implicated into clinical ambience aiming to upgrade diagnostic procedure or to help to predict prognosis as there is an increasing need for novel clinical tools and solutions.

The name "omics" introduces a field of biologic studies of particular molecules classes, such as metabolomics, proteomics or genomics and transcriptomics. This is the set of analytical approaches that uses different methodologies in order to uncover the molecular landscape of disease [1]. The main objective is the identification of disease biomarkers.

For decades genomics and transcriptomics were developing rapidly, as the association between diseases and genes had been investigated profoundly, while the progress of the proteomics underwent significantly slower, mainly due to the complex nature of proteins, biofluids and also specimen handling limitations, so that it makes challenging the characterization of tissues or cells [2]. Besides, a sufficient numbers of samples needs to be obtained in order for the findings to be sufficiently reliable and robust [3].

Proteomics provides a knowledge of the protein collection within a cell (proteome) and this study can provide data about their quantity, variations or modifications. Its limitation is a known dynamicity and instability of a proteome in contrast to genome which is relatively stable.

Clinical proteomics deals with proteome identification in biological fluids (blood, urine, cerebrospinal liquid, saliva) or tissues. Body fluids, as the source of disease biomarkers have their "pro" and "contra": they are generally more available for collection (except cerebrospinal fluid) but vary in a concentration of proteins. The highest proteome content in liquids is in blood, but its main limitation is that the blood represents the proteome of the whole organism, so it is difficult to attribute the findings to specific biomarker research. Tissue proteome is generally more enriched with proteins and their concentration is higher, we can also ensure, that the origin of the protein belongs to the exact organ. However, the procedure of collection is invasive and the number of samples is lower, which can statistically compromise the power of data obtained.

One of the most disposable human fluid samples for proteomic research is urine. It can be easily non-invasively and continuously obtained and in large quantities. The proteomic studies are currently attempting to find an alternative substitute to a kidney biopsy, which is a standard for glomerular diseases diagnosis, nevertheless its invasiveness and possible risks. Researchers report the urgent need of new biomarkers discovery in chronical kidney disease (CKD) to minimize the invasiveness, speed-up the diagnostic procedure and provide the necessary prognostic information to patient and the evaluation of new strategies of averting loss of kidney function in CKD is ongoing. Furthermore, clinical need is supported by the fact, that serum biomarkers, as creatinine or albumin may remain normal or moderately variable while the disease progresses due to the compensatory properties of the organism [4, 5]. The only defect of this material is that the urinary proteome has a prominent variability among different individuals and even in the same individual under different physiological conditions. On-tissue proteomics, indeed, provides a more stable proteome that can not only reflect the state of the disease, but also capture the changes of the different stage. The analysis of individual proteins does not fully correspond to the disease pathophysiology, while complete on-tissue analysis has made a great contribution in putative biomarkers discovery and their value in prognosis. The only remaining challenge in this case is a dynamic protein concentration [1].

One of the most widespread techniques employed in clinical proteomics is mass spectrometry (MS) which is an analytical approach based on ionization of the substance (solid, liquid or gas) with subsequent detection and separation of ions based on their mass-to-charge ratio. The results are displayed in spectra with the relative intensity of each peak which demonstrates the abundance of the ions and this is a concept of mass spectrometry imaging (MSI). The molecules or atoms than can be putatively identified later by their masses and database research. One of the most commonly used types of MSI is matrix-assisted laser desorption/ ionization (MALDI) as it is quite sensitive and able to ionize the various classes of analytes with the most versatile mass range. The concept of MALDI-MSI is application of matrix (crystallized molecules) directly on tissue and creating ions with minimal fragmentation of molecules as only small portion of energy is being transferred, making the technique suitable also for fragile molecules. The main analyte classes are: proteins, peptides, lipids, metabolites. Important point is preservation of spatial distribution of analytes and the morphological structure of the tissues, permitting the on-site co-localization with stained tissue section (the same fragment or consecutive section). MALDI-MSI has been currently used in pathological, oncological, forensic and pharmacological studies [1, 6].

In CKD studies MALDI-MSI has shown significant results on fresh frozen (FF) samples as well as formalin-fixed paraffin embedded (FFPE) tissues, which provides us capacity of retrospective analysis. There data on putative biomarkers and proteomic profiles for different forms of primary and secondary glomerulonephrites are being published as for: membranous nephropathy, focal segmental glomerulosclerosis, IgA nephropathy, diabetic nephropathy and others indicating sets of signals distinguishing the pathologies and their correlation with histological and immunohistochemical data [1, 7, 8]. This demonstrates MALDI-MSI to be a novel and promising clinical technique for a non-invasive diagnosis, encouraging the revelation of new specific prognostically significant biomarkers, better understanding of the nature of disease and increased capacity of monitoring progression. Distinguishing the molecular nature of the disease will give a new spin in our knowledge of pathophysiology and management strategies improvement.

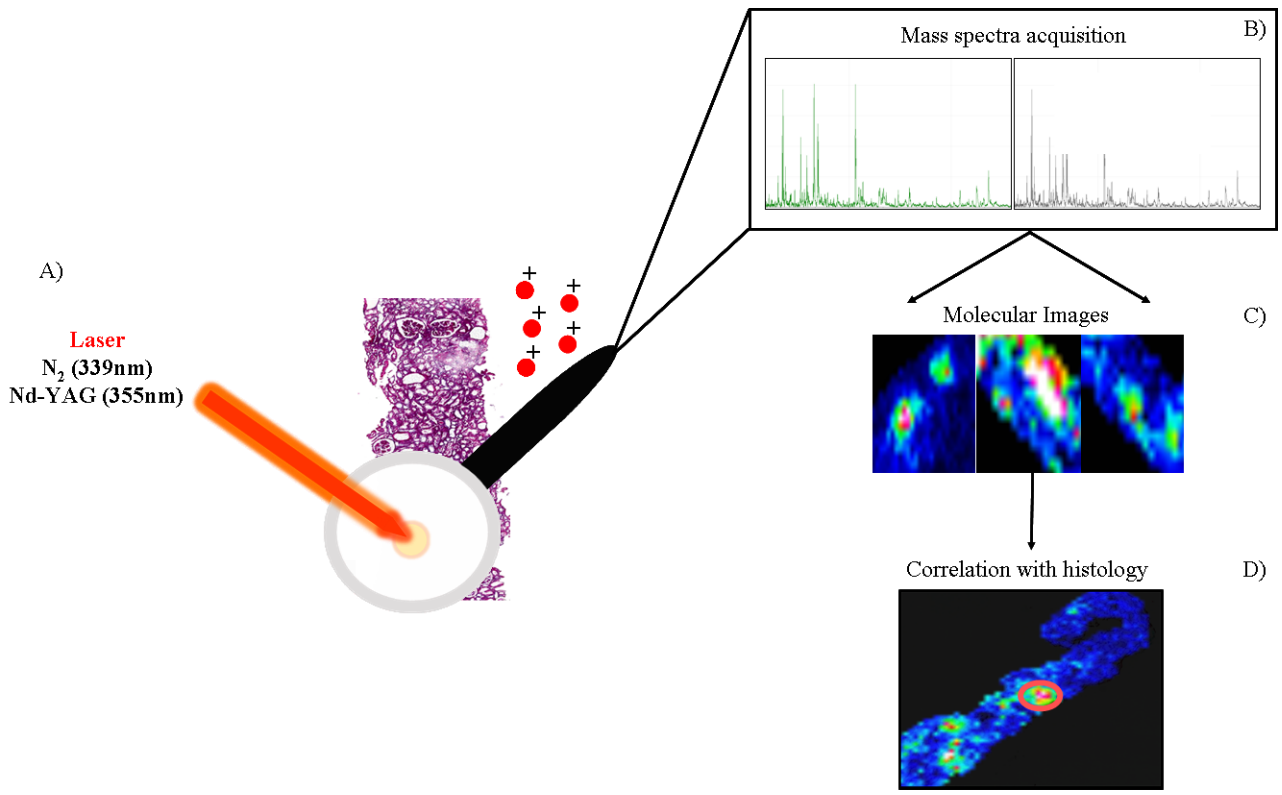

Figure 1. Schematic representation of the MALDI-MS Imaging process. (A) Ablation of the MALDI matrix leads to the desorption and ionization of matrix and analyte ions. (B) Mass spectra are then automatically acquired at discrete spatial co-ordinates. Following this, (C) molecular images representing the spatial distribution of the ions present in the spectra can be generated and (D) correlated with a corresponding histological image.

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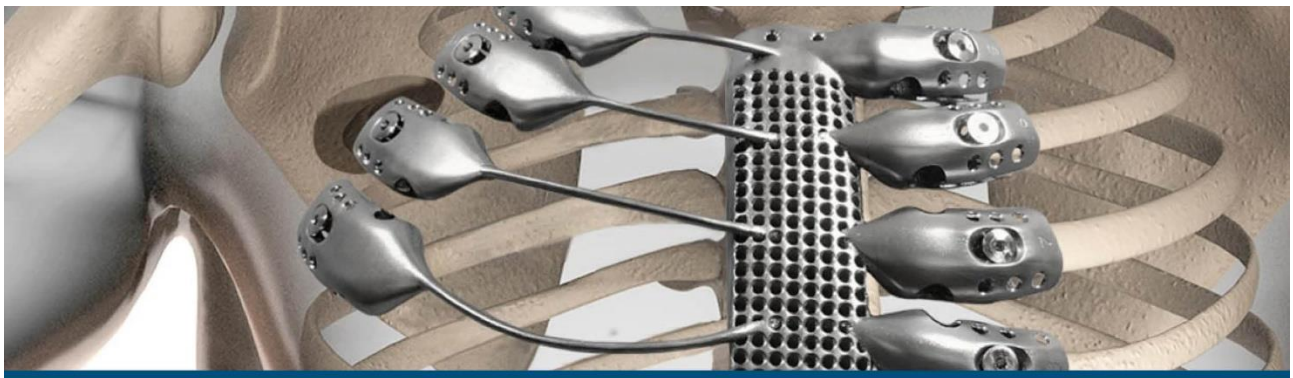

BONE FORMATION WHEN IMPLANTING MESH STRUCTURES OF TITANIUM NICKELIDE INTO A BONE DEFECT

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Abstract

Purpose of Study*: To study reparative osteogenesis and tissue integration characteristics for implanting three-dimensional mesh structures of titanium nickelide into a bone cavitary defect.* ***Material and Methods****: The authors modeled cavitary defects of femoral metaphysis experimentally in Wistar rats divided into an experimental group and control one. The study duration was 60 days in total. The methods of radiography, those of light and electron microscopy, X-ray electron probe microanalysis used.* ***Results****: Under implantation the defect was filled with cancellous bone the volumetric density of which more than 1,5-fold exceeded control values ($p < 0.001$). The implant had biocompatibility, osteoconductive and osteoinductive properties, it stopped inflammatory processes. The membrane protective barrier which prevented connective tissue sprouting was formed on the implant surface in the defect periosteal zone. The osteointegrative junction was formed being persisted up to the end of the experiment. Reparative osteogenesis was performed by direct intramembranous and apposition type.* ***Conclusion****: The implant of three-dimensional mesh titaium-nickelide structures has marked osteoplastic properties, and it can be successfully used in orthopedic surgery.*

Key words: *Reparative osteogenesis, Bone defect, Implant, Mesh structures, Titanium nickelide.*

Introduction. Connective tissue ingrowth from the periosteal surface is the main obstacle for restitution of large-volume bone defects that is caused by a higher rate of migrating fibroblasts comparing with osteogenic cells [1-3]. This can inhibit reparative osteogenesis process completely or partially, as well as be a cause of the defect filling with dense connective tissue of scarry type. In order to create optimal conditions for formation

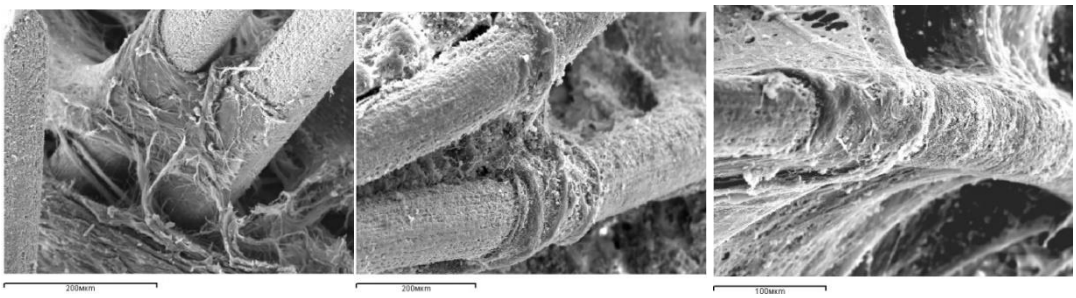
of organotypic regenerated bone the technique of guided reparative osteogenesis was developed using the membrane technology which prevented connective tissue sprouting [4,5]. The membranes of synthetic and natural materials are used for this purpose which, however, are not osteointegrated, they can cause an inflammatory reaction and tissue swelling, in case of their use a repeat surgical intervention is required [6,7]. New possibilities have arisen due to introducing medical technologies related to using the implants based on nickel and titanium which are approached to bone tissue by their mechanic characteristics and are biocompatible [8-12].

The purpose of this work is to study reparative osteogenesis morphological features when implanting mesh structures of titanium nickelide into a cavitary defect of femoral metaphysis.

Materials and Methods. Cavitary defects of femoral metaphysis modeled in adult male Wistar rats in the experimental group (n=20) and control one (n=20); the defect volume was 0.02 cm^3 that amounted for about 40% of total metaphysis volume. All the manipulations were performed according to the Ministry of Health Order No 708 of 23.08.2010 "*Approval of the rules of good laboratory practice".* The implant was introduced into the defect in the animals of the experimental group, no additional manipulations performed in the control group. The implant was a mesh framework made of nickelide-titanium thread (TH-10 brand of 90 µm caliber) formed by the type of knitting with cells – through open pores of 100-300 µm diameter[12]. The thread was made of composite material comprising a core of nanostructured monolithic titanium nickelide and a titanium-oxide microporous surface layer of 5-7 µm (Certificate No POOCRU.AЯ79H18304). The animals were withdrawn from the experiment after 7, 14, 30 and 60 days (five animals were used for each time point). The bone meta-epiphyseal zone was sewn out, fixed in 2% paraformaldehyde and glutaraldehyde solution, embedded in araldite and paraffin (after decalcification). Histological sections were stained with hematoxylin, eosin and by Van Gieson. The araldite blocks studied using INCA-200 Energy X-ray electron probe micro-analyzer (Oxford Instruments, England) and JSM-840 scanning electron microscope (Jeol, Japan). Bone tissue volumetric density, index of compactness and the content of calcium, phosphorus, magnesium, sodium and sulfur were determined in the regenerated bone [10,11].

Methods of a Statistical Analysis made using *Microsoft Excel – 2010* Program. The data were presented as mean value (M), error of representation (m) and level of difference significance (p). The significance of the intergroup differences of the compared parameters in view of normal distribution were calculated using Student t-test. The differences considered statistically significant at $p < 0.05$.

Results. The process of bone formation which occurred from periosteum, endosteum, bone marrow and the damaged bone structures of the defect edges was observed in the both groups of animals 7, 14 days after surgery. In the control group of animals a non-matured regenerated bone (of connective-tissue type) was formed in the periosteal zone, its collagen fibers grew from periosteum into the defect central zone as strip-like bundles. The defect was filled with loose connective and granulation tissue where the foci of lymphocytic and plasmacytic infiltration and fibrin clots were located. The islets of reticulofibrous bone tissue represented as a fine-cellular network of interwoven bone-osteoid trabeculae were formed near the defect outer edges in the periosteum, as well as in the endosteum. Randomly arranged fragments of the damaged bone structures, as well as separate unrelated foci of newly formed bone tissue as short bone-osteoid trabeculae lining the defect inner surface located near the defect inner edges. The bone tissue volumetric density in the defect and the compactness index of the regenerated bone amounted to about 30% ($p < 0.001$) of the intact metaphysis values 14 days after surgery in the control group of animals (*Table 1*).



A B C

Fig. 1. Connective-tissue cover on the implant surface in the defect periosteal zone 7 (A) and 14 (B, C) days after surgery. Scanning electron microscopy, magnification × 160.

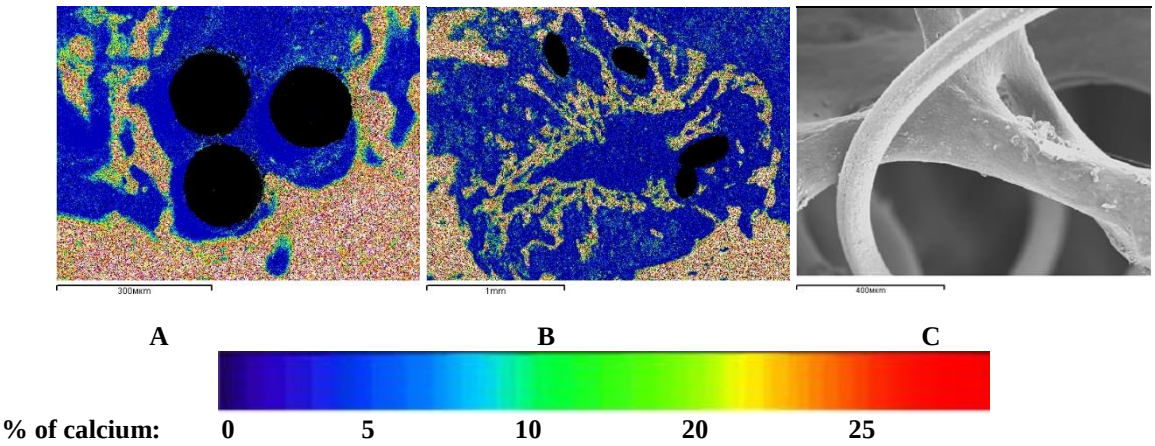


Fig. 2. Reparative osteogenesis in the metaphyseal defect 7 (a) and 14 (b, c) days after surgery, arrows indicate the areas of osteointegration. *a, b* – charts of x-ray electron probe microanalysis, images in calcium characteristic x-ray emission, *c* – scanning electron microscopy (organic components removed with 6% sodium hypochlorite solution), magnification: a - × 100, b - × 25, c - × 70.

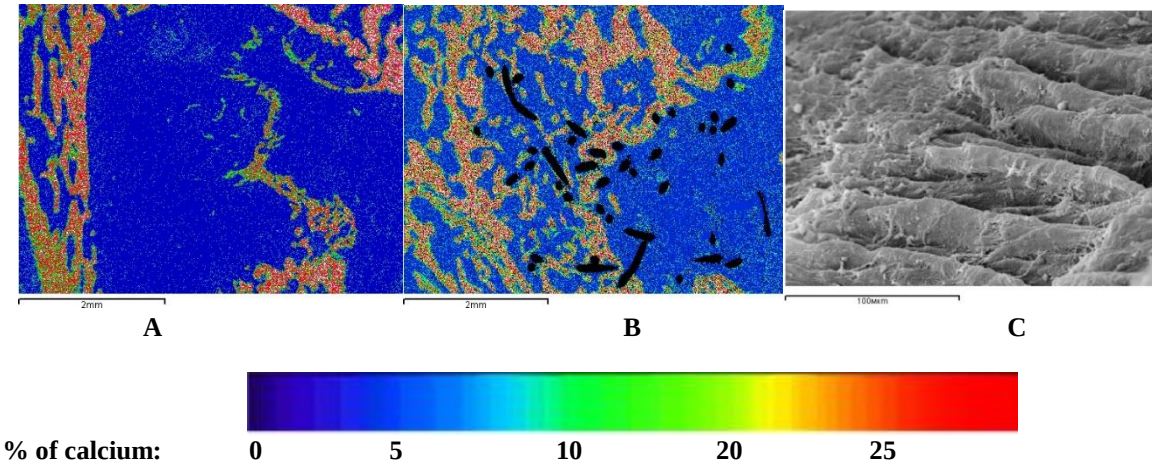


Fig. 3. The metaphyseal defect filling 30 days after surgery in the control (a) and experimental (b, c) group of animals, *a, b* – charts of x-ray electron probe microanalysis, images in calcium characteristic x-ray emission, magnification × 20; *c* – scanning electron microscopy, magnification × 500.

A thin membrane-like cover of connective tissue was formed round the implant threads and cells in the defect periosteal zone in the experimental group animals 7, 14 days after surgery (*Fig. 1a*). The cover formation began on the surface of the thread in the places of its weavings and spread from the periphery of the cells to their center. The cover had a layered structure. The inner layer consisted of dense formalized connective tissue. Collagen fibers were collected into dense circularly oriented lace-like bundles, and they braided the implant threads in the form of a sleeve, they were firmly fixed to their microporous surface, grew into the gaps between them and provided the fixation of the implant threads both between each other and in the bone defect (*Fig. 1b*). The outer layer of the cover was formed with dense non-formalized connective tissue the thin flat wavy twisted collagen-fiber bundles of which located as a fine-cellular network between the lace-like bundles of the inner layer framework and connected with surrounding bone and connective-tissue structures (*Fig. 1c*). The areas of active appositional bone formation were observed below the connective-tissue cover in the endosteal and central zone of the defect and at its edges round the implant structures, as well as on their surface. A layer of reticulofibrous bone tissue of 300-400 µm thickness emerged on the implant thread surface directly forming osteointegration connection (*Fig. 2a*). The implant threads in the osteointegration areas were coated with mineralizing bone matrix. Newly formed trabeculae grew into the implant fine-cellular structure

(*Fig, 2b, 2c*). The results of quantitative studies (*Table 1*) evidenced of reparative osteogenesis significant activation, as well as of increasing the maturity degree of newly formed bone tissue in the regenerated bones of the animals of the experimental group comparing with those in the control group. Thus, bone tissue volumetric density in the defect was 144.19%, index of compactness – 155.56% in comparison with the values in the animals of the control group ($p < 0.001$).

The defect was filled with regenerated bone 30-60 days after surgery in the control group of animals, where little-mineralized dense non-formalized connective tissue growing into from the periosteal surface prevailed (*Fig. 3a*). The initial stages revealed for periosteal-intermediary uniting and forming cortex resembling cancellous bone by structure. The operated metaphyseal zone acquired a marked conical shape. Little-calcified dense connective tissue prevailed in the periosteal zone of the regenerated bone. The fine-cellular bone structures of the periosteal regenerated bone fused with endosteal newly formed trabeculae, arcuately grew into the defect central zone and formed a thin crescent layer of newly formed cortical bone. Osteogenesis foci were observed in the defect central and marginal zones where osteoid areas revealed, as well as fragments of newly formed little-mineralized reticulofibrous bone trabeculae isolated from each other by wide interlayers of loose connective tissue with the cavities filled with lymphocytic and macrophage elements. Bone tissue volumetric density in the defect, index of compactness of the regenerated bone, the content of calcium and phosphorus amounted to 50-60% of the intact metaphysis values ($p < 0.001$) (*Table 1, 2*).

Table 1

Bone tissue volumetric density in the metaphysis defect in the animals from the control group (Cont) and the experimental one (Exp) and in the intact metaphysis of the contralateral limb (M±m)

Parameters	Period of the experiment, days						Meta-physis
	14		30		60		
	Cont	Exp	Cont	Exp	Cont	Exp	
Bone tissue, %	8.443± 0.381	12.174± 0.613[1]	13.543± 0.681	19.764± 0.962[1]	15.022± 0.744	22.984± 1.094[1]	25.072± 1.212
Index of compact-ness	0.092± 0.005	0.143± 0.012[2]	0.164± 0.013	0.252± 0.021[2]	0.181± 0.013	0.310± 0.021[2]	0.333± 0.024

Note. [1, 2, 3] intergroup differences ([1] $p < 0.001$, [2] $p < 0.01$, [3] $p < 0.05$)

Table 2

Content of osteotropic chemical elements in the regenerated bone of the control and experimental groups of animals 60 days after surgery and in the intact metaphysis of the contralateral limb (M±m, %)

Elements	Control	Experiment	Metaphysis of contralateral limb
Sodium	0.41±0.02	0.44±0.02	0.40±0.02
Magnesium	0.22±0.01	0.25±0.01	0.22±0.01
Phosphorus	1.93±0.04	2.94±0.13[1]	3.22±0.15
Sulfur	0.23±0.01	0.30±0.02[2]	0.22±0.01
Calcium	3.85±0.16	5.89±0.26[1]	6.44±0.31

Note. [1, 2] intergroup differences ([1] $p < 0.001$, [2] $p < 0.05$)

In the experimental group of animals the area of bone defect was filled with regenerated bone where cancellous bone prevailed 30-60 days after surgery (*Fig. 3b*). A new area of cortical layer was formed represented as compact bone of lamellar structure. The bundles of collagen fibers of the protective cover dense connective tissue located on the defect periosteal surface round the implant which formed the interweaving of village fence type (*Fig. 3c*). The implant threads were surrounded by osteoid or they were completely overgrown by newly formed bone tissue thereby forming a composite – compact bone reinforced by titanium nickelide. Bone tissue volumetric density, index of compactness and mineralization degree of the regenerated bone were somewhat less comparing with the intact metaphysis values, but these differences were not statistically significant by the end of the experiment, and, at the same time, they more than 1.5-fold exceeded ($p < 0.001$) the values in the control group of animals (*Tables 1, 2*).

Discussion. The results of the presented study demonstrated that a layer of dense connective tissue was formed in the defect periosteal area, it served as a biological protective barrier and prevented sprouting of paraosseous connective tissue. Besides, the defect was filled by cancellous bone the volumetric density of which more than 1.5-fold exceeded control values at all the stages of the experiment, and the bone mineral composition approximated the values of the cancellous bone in the intact metaphysis. Reparative osteogenesis occurred by the type of direct intramembranous and appositional osteogenesis. The signs of inflammatory process observed in no cases that was confirmed by our previous data [8,10.11]. The microporous structure of the implant thread surface layer provided osteoblast adhesion, osteointegration and osteoconductive properties. Adsorption of endogen bone morphogenetic proteins the functional activity of which provided the implant osteoinductivity occurred due to the implant capillary properties [13].

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METHODICAL ISSUES OF ASSURING DOCTORS' PORTFOLIO INFORMATION RELIABILITY DURING CONTINUOUS MEDICAL EDUCATION

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Abstract

The technology of creating doctors' portfolio during continuous professional development is considered. Particular attention is paid to the methodological issues of information reliability assurance. To assure doctors' portfolio information reliability through the widespread use of correlation analysis, in particular correlation portraits (pleiades), is shown to be possible. The correlation portraits are said to ensure the portfolio's high representation by visualizing all the significant correlations and identifying both the factors of higher and lower value, that provide effective doctors training.

Key words: *doctor's portfolio, doctors continuous professional development, information reliability, correlation pleiades, correlation portraits, correlation of individual and contingent performance indicators.*

Portfolio, as a part of educational and professional activities identification, is widely used throughout medical education: from the University – through continuous professional development – to professional application programs. Numerous reviews presented their different definitions and differences in the use [23, 31]. There have been stated several objectives to evaluate portfolio in medical education and professional work. The first one is to check the studies or professional activity [26, 29] with the focus on critical reflection as

the dominant element of the academic activity and its content regarding many issues relating to personal and professional development. It stands to reason that the target of evaluation is to improve training. Portfolio is assumed to have two rating clusters to fully appreciate the process: experts' and personal opinions. To solve the latter portfolio should include clear and necessarily critical reflection and self-reflection. The second goal is to provide a complex evaluation of competency-based academic and professional activities, fully integrated into the curriculum. This may include the reflection as a desired competence among many others [24]. This type of portfolio is well developed in some countries of North America and Europe, and it supports students and physicians' continuous professional development. It evaluates a range of competencies including basic scientific, clinical and public health knowledge, procedural and clinical training skills, proper professional behavior (such as self-reflection, empathy, being a team player and lifelong learning motivation) [7]. Finally, the third goal focuses on evaluating changes at competence and knowledge levels.

But the mentioned goals haven't had any valid statistical demonstration. There are no reflected processes identification characteristics as well as technologies for evaluating the dynamics of doctors' competence coefficient. An important indicator of portfolio information – reliability – remains ill-defined.

The purpose of the work is to substantiate portfolio information reliability technology.

Results and discussion. First of all, we emphasize that the concept of reliability, as an important intuitively comprehensible word, does not often contain any clear information. According to the international finance dictionaries, information is reliable, if it contains no significant errors, and it is dependable for users [16]. Unfortunately, to measure what means "significant errors" or "dependable " is very difficult.

Medical professionals receive information from various sources. The most common sources are perceived as reliable, but their reliability is actually far from the truth and has the different degree of probability.

Information reliability is provided by its truthful representation (information should correspond to the facts), substance over form; neutrality (the developers' subjective opinion should not affect the reporting); caution (it involves the necessity for caution while forming judgments); the completeness of data presentation.

The systematic medical literature review of portfolio usage reliability validation [7, 23] attests to the fact that this index, if the process facilitated in a suitable manner, can be defined by high values, however, in a number of situations it may be very low.

Kane's system, based on the arguments, is widely used (fig. 1). It identifies four conclusions in the ground argument: activity scope estimation (score); the performed operations quality integration; the obtained results extrapolation for justification with a view to substantiate the functionality capabilities of learners as specialists as well as foreseen hazards (after-effects). Evidence should be collected to justify each of these findings and be focused on the most dubious conjectures in the line of reasoning.

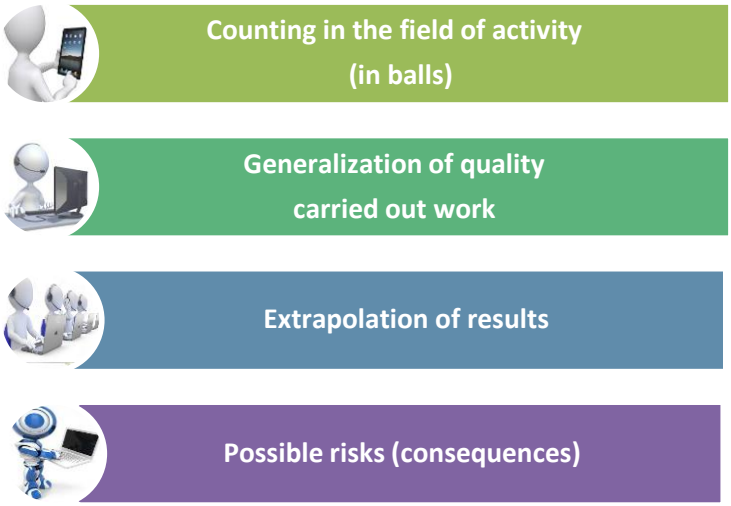

Fig. 1. Basic arguments for Kane's system.

The main conjectures (and indispensable evidence) differ depending on the intended use or the related decision. In various studies, such measurements are recommended to be taken by two or more experts. The results tend to support a holistic assessment, but the analytical estimates warrant further study.

The undertaken correlation analysis between student portfolio and traditional assessment approaches to students' competence and preparedness for licensing has shown low, but significant correlation parameters: $r = 0.32$, $p < 0.01$. The low and week correlations are observed between the portfolio data and a mean score during training and a test score. According to the other studies, the correlation parameters amount to 0.92. Some portfolio components, however, vary very much, that leads the investigators to give additional recommendations towards improving the structure of portfolio [3, 9].

According to the argument-based approach to interpreting and using test scores, the portfolio analysis data can be considered valid. Conversely, the interpretations or applications that are short on substantiation or the ones, related to dubious findings or conjectures are not considered to be valid. It should be emphasized that the validity of the proposed interpretation is also to be evaluated in terms of completeness, consistency and credibility of its conclusions and assumptions.

With the object of evaluating information reliability we proposed using correlation portraits (pleiades). It being understood that using correlation coefficients in dynamics, applying multiple correlation in a wide range and carrying out a comparative analysis of correlation portraits as images are the hallmarks of our approach.

Developing correlation portraits facilitates a solution to several problems: a) identifying certain doctor's training and professional activities characteristics, which are tightly bound to the other characteristics (it is usually determined by the number of links); b) identifying doctor's professional activities specifications, which are strongly connected with training indices and independent doctor's professional activities features; c) identifying such variables, which statistically significant correlate with any objective indicators (successful activities, academic performance, etc.); d) defining doctor's psychological structure.

The obvious advantage of the approach is compactness (this presentation model allows the researcher to compactly and efficiently present the analysis findings) and simple measurements (as the correlation parameter value varies from –1 to +1, then the numeric expression is indicative of the bond strength). Obviously, most relationships among variables in the professional activity characteristics are nonlinear, in other words, there is no any direct dependence between them. However, using correlations in this case is possible.

Some other methodological complexities for using correlation portraits are possible outliers, put in other words, such examinees' indices which differ fundamentally from the average. It is apparent that keeping track of doctor's skill level is possible through implementing a long-term monitoring and ongoing taxonomic analysis. They are the ones which make it possible to validate a decision concerning data exception from the analysis for improving the result reliability.

Therefore, to improve the results reliability and accuracy one should preliminarily use a scattering graph and the linear chart of relation among variables.

Using the correlations of individual and contingent training performance has also been proposed.

Conclusions.

1. To assure doctors' portfolio information reliability through the widespread use of correlation analysis, in particular correlation portraits (pleiades), is shown to be possible.

2. The correlation portraits allow one to ensure the portfolio's high representation by visualizing all the significant correlations and identifying both the factors of higher and lower value, that provide effective doctors training.

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THE MEANING OF ETHICS FOR HUMANITY: MEDICAL ASPECT

We are bequeathed by a world of action; of the violence and wars and persecutions that underlie the suffering we end up trying to treat in healthcare and that trickles through the lives of different generations carrying the burdens of traumatic memories.

The actions, though, that permeate the boundaries of societies and cultures are the final telos —the final acts in a chain of events. Whilst the actions are the physical forces that result in the annihilation of both humanity and life, the predecessors of an action are indeed the sublime; the unseen yet felt, the shapeless yet defined, and the nothingness that is absolute. It is here in this vortex between thought and action that the domain of ethics exists.

Part of the challenge for finding meaning of ethics for humanity is to contextualise the lived experiences of those who's humanity has been de-faced and denied into the ethical principles that have governed and guided structures of how we treat the body in medicine and society for centuries.

Ethics emerges as an aspiration of the ways that we should expect an individual to be treated. In other words, when treating a patient in a hospital, the patient, under standard circumstances regarding capacity to make decisions, occupies the freedom for their own personal narrative. The patient can make an autonomous decision whether to receive treatment, or refuse treatment, regardless of the consequences to their health and prognosis to their life. However, this condition of autonomy is only functional when the person is subjected to other freedoms. The societal structures are the basis for allowing humanity to thrive.

As we progress further into the varied discourses of artificial intelligence, cryonics, genomics, and other manipulations of traditional categories of birth, living, dying, and death, the terrain of the ethics of humanity seems very distance when we are constantly trying to transcend and transgress the roots of our historical foundations. However, the concepts that we need to situate our newness of humanity in have not yet risen. We need to work to develop our reflections and critiques both in originating new concepts but also to disseminate in new ways.

To talk of humans in our societies and healthcare settings we typically frequent terminologies such as categories of an individuals' identity in society such as celebrity or politician or criminal or victim or refugee. Bringing narratives that are beyond the bounds of socially constructed facets of who we are is challenging. We then have to develop new skills to be comfortable with multiplicity and complexity as well as uncertainty—even though these aspects still prevail whilst suppressed and denied spaces to surface. The language we use, then, is important. For ethics of humanity to progress, we need to see human stories, not case studies, and names, not numbers. We need to reflect on where we situate those who we are referring to; who is representing stories and where are we placing those who are not being heard? For example, in humanitarianism, we talk of the 'field', of *being in the field* to respond to the crises of humanity; *being in the field* of the witnessing sufferings that do not belong to our own as outsiders.

Yet, those fields are homes; and homes that are being violated or destroyed or destructed through various means. That tragedy of the home and belonging and land is one of our greatest ethical threats to humanity. How can we exist without a place to create our lives? Yet, reducing the home to a field, a generic space that is the hustle and bustle of an emergency situation suspended in time from the disastrous event/s, takes away the cultural legacies that created the memories and histories of the land, so that its meaning was *home.*

The fundamental future for the meaning of ethics for, in, and of humanity is to consider who we are and how we treat each other—age-old reflections on an old humanity yet nevertheless essential for there to be a deeper, richer humanity. Within this continued phenomenology, ethics must take centrefold in the scripting of the narratives of our local and global societies and shared-ness of our human story. Our ethics must be interconnected through values; our cultures are not defined by differences nor can a culture be traced to a beginning or ending; rather, we seek our human identity through our cultural connections. We are all part of a culture and this is our shared-ness.

Humanising ethics to create rather than violate is the language we need to develop. Through a humanised ethics then there can be potential for meaning for humanity—without a vision towards humanity we will escape the virtues that we are capable of to *feel* human; compassion, kindness, respect, or welcoming for who we are in relation to others. The concepts for humanity are key. Ethics is what gives such concepts meaning and are the future for humanity.

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Requirements for papers

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- Paper should include no more than 7 keywords.
- Papers should be compiled in the following order: title page; abstract; keywords; main text; acknowledgments; appendixes; references.
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- Endnotes should be marked clearly in the text at a point of punctuation, and listed consecutively at the end of the paper. They should not be listed at the bottom of each relevant page.
- The full references should be listed at the end of the paper. They must include the names and initials of all the authors, the year of publication in parentheses, the full title of the paper (or book), the full name of the journal, the volume number and pages and, for books, the publisher's name and city of publication. The references in the text should be done in square brackets (for example, [2; 4; 15]).

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